



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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| <p>(51) International Patent Classification⁴ : E04H 6/28</p> | <p>A1</p> | <p>(11) International Publication Number: WO 88/ 09420 (43) International Publication Date: 1 December 1988 (01.12.88)</p> |
| <p>(21) International Application Number: PCT/IT87/00104 (22) International Filing Date: 31 December 1987 (31.12.87) (31) Priority Application Number: 47961 A/87 (32) Priority Date: 21 May 1987 (21.05.87) (33) Priority Country: IT (71)(72) Applicant and Inventor: CITI, Stefano [IT/IT]; Viale Teocrito, 98, I-96100 Siracusa (IT). (74) Agent: MASCIOLI, Alessandro; A.N.D.I., Associazione Nazionale degli Inventori, Via Lima, 35, I-00198 Roma (IT). (81) Designated States: AT (European patent), BE (European patent), CH (European patent), DE (European patent), FR (European patent), GB (European patent), IT (European patent), LU (European patent), NL (European patent), SE (European patent), US.</p> | | <p>Published With international search report.</p> <p>$\gamma = \alpha \cdot 1 - 18.$</p> |
| <p>(54) Title: AN AUTOMATIC GARAGE WITH ROTATING PLANES AND AN ELEVATOR</p> <div data-bbox="625 1144 1128 1722" data-label="Image"> </div> <p>(57) Abstract</p> <p>A modular container for the automatic recovery of vehicles, on rotating planes and vertical elevator, comprising horizontal parking planes, single or multiple and superimposed, each consisting of a plurality of support shelves (5) onto which the same number of boards (6) carrying the vehicle will be placed. Said planes are movable clockwise and anti-clockwise in rotary sense.</p> | | |

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An automatic garage with rotating planes and an elevator.

1 The present invention concerns a container for the automatic
5 recovery of vehicles of the mechanic and modular kind, comprising one or more rotating planes and a vertical elevator.

Parking plants below the ground level are already known, for the transport and the housing of vehicles or superimposed
10 planes, comprising automatic devices for the horizontal translation of the shelves carrying said vehicles when looking for parking areas. Said plants request considerable digging depth for the realization of a plurality of parking planes with consequent technical difficulties for the construction,
15 high costs and the impossibility of realization in limited digging areas.

It is therefore the aim of the present invention to realize a container for the recovery of vehicles that may keep a
20 high number of said vehicles in areas of small depth.

The aim set forth is reached according to the present invention by means of a container comprising a plurality of horizontal parking planes, single or multiple, superimposed, each
25 consisting in a plurality of support shelves onto which the same number of boards carrying the vehicles will be placed.

Said planes are rotatably moving clockwise and anticlockwise.

30 The vertical moving for the transport of the parking planes

- 2 -

will be provided, according to the present invention, by means of a mechanical, hydraulic or pneumatic hoister, said elevator shelf.

- 5 The sequences of parking and taking of the vehicle are operated by electronic or electromechanic devices.

The present invention will be described hereinbelow according to the attached drawings in which a preferred embodiment is shown.

10

Figure 1 shows a plant view of the container according to the present invention at the level of a parking plane.

15

Figure 2 shows a vertical section of the container along a plane passing through the free space 0 that allows the vertical movement of the elevation shelf.

- 20 Figures 3 and 4 show plant views of the container respectively at the ground level with access to the auto-parking and at the ground level of the container.

The figures show a modular container for the automatic recovery of vehicles, mainly comprising an outer cylindrical structure 1, built on basements 2, and provided with the central concentric cylindric area 3 for the services and the motorization, and with horizontal parking planes 4,

25

- 3 -

consisting in a plurality of support shelves 5 on a plurality of planes onto which the same number of boards 6 are provided carrying the vehicle.

- 5 Between said boards 6 a free space 0 is provided that allows the vertical moving of elevation shelf 7.

The working of the object of the present invention, with the storing or parking sequence of the vehicles, may be
10 described as follows:

- a board 6 supported by the elevation shelf 7 is at the level of the access plane A;
- in that moment one of the horizontal parking planes 4
15 is without board 6;
- the vehicle, driven by the owner, gets on board 6, appropriately provided for the exact placing of said vehicle;
- the horizontal parking plane is in the exact position
20 for receiving the ensemble board/vehicle;
- the elevation shelf starts the vertical movement for placing board 6 onto the horizontal parking plane 4;
- once the horizontal parking plane 4 has received the ensemble board/vehicle, a rotation starts that will allow the elevation shelf a free board to bring back to
25 the ground level;
- said operations will be performed until the first parking floor 4 is filled up, and then the following floors

- 4 -

are also filled up;

- should the whole container be filled up, the parking floors will be all placed with the respective free spaces 0 onto the same vertical axis and in coincidence, and the elevation shelf will be placed at the ground level.
- 5.

It is obvious that the operations for taking the vehicles will be performed vice versa with respect to the storing ones, but always operated by an automatic device of the known kind.

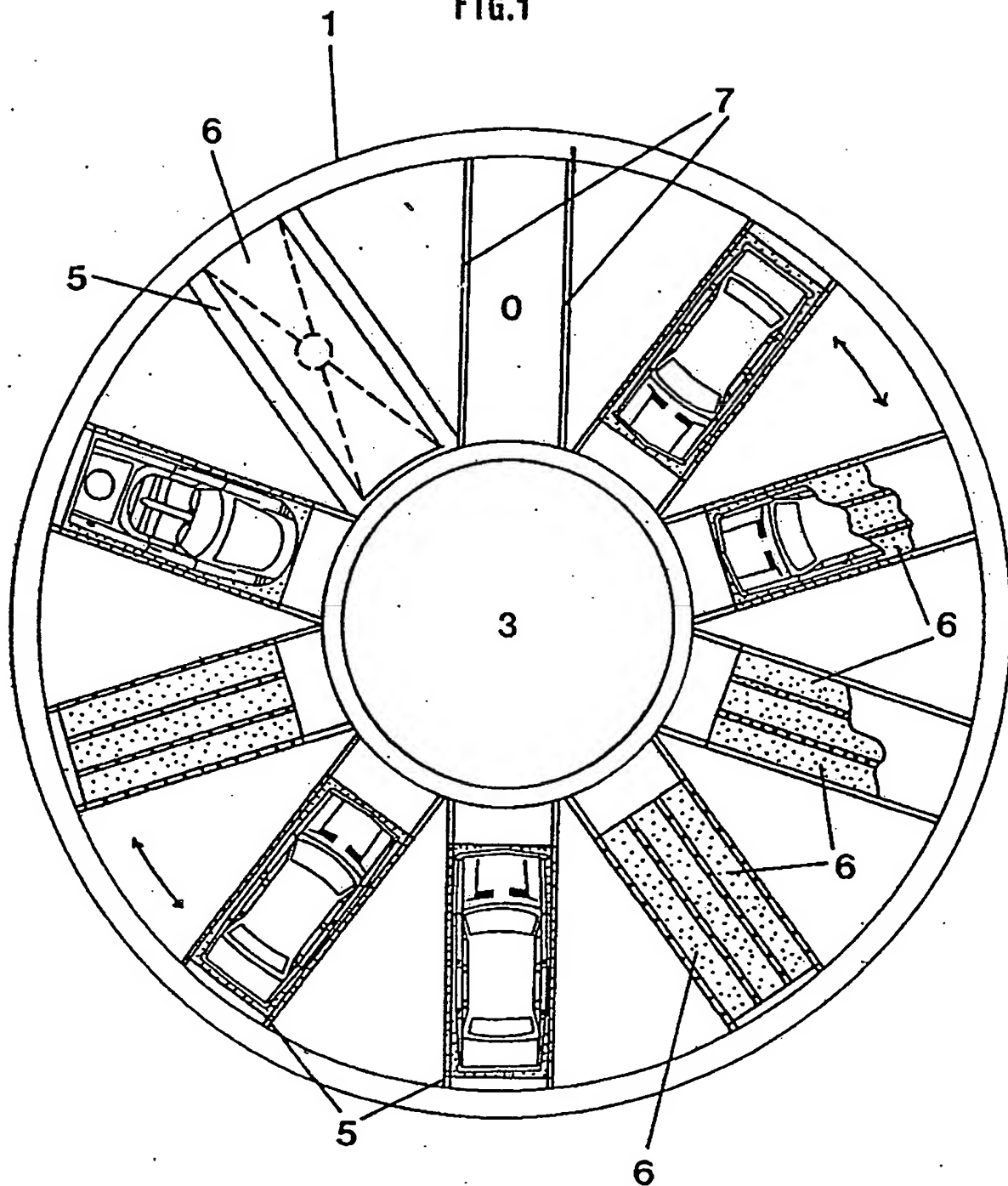
CLAIMS

1. A modular container for the automatic recovery of vehicles,
on rotating planes and vertical elevator, characterized in:
 - 5 - a cylindrical structure (1), resting on basements (2);
 - a central cylindrical area (3), concentric to said structure (1), for the housing of the services and the motorization;
 - a plurality of horizontal parking floors (4), consisting
10 of support shelves (5);
 - a plurality of boards (6) carrying the vehicles, that may be placed in correspondence to said shelves (5);
 - a free space (0) provided between said boards (6), for the vertical movement of elevation shelf (7).
- 15 2. A container according to claim 1, characterized in the following functioning sequence:
 - a board (6) supported by the elevation shelf (7) is placed at the same level than access plane (A);
 - 20 - in that moment, one of the horizontal parking floors (4) is left without board (6);
 - the vehicle driven by the owner gets onto board (6), appropriately provided for the correct placing of said vehicle;
 - the horizontal parking floor is in the correct position
25 for receiving the ensemble board/vehicle;
 - the elevation shelf begins a vertical movement for the placing of the board (6) onto the horizontal parking
4 floor (4);

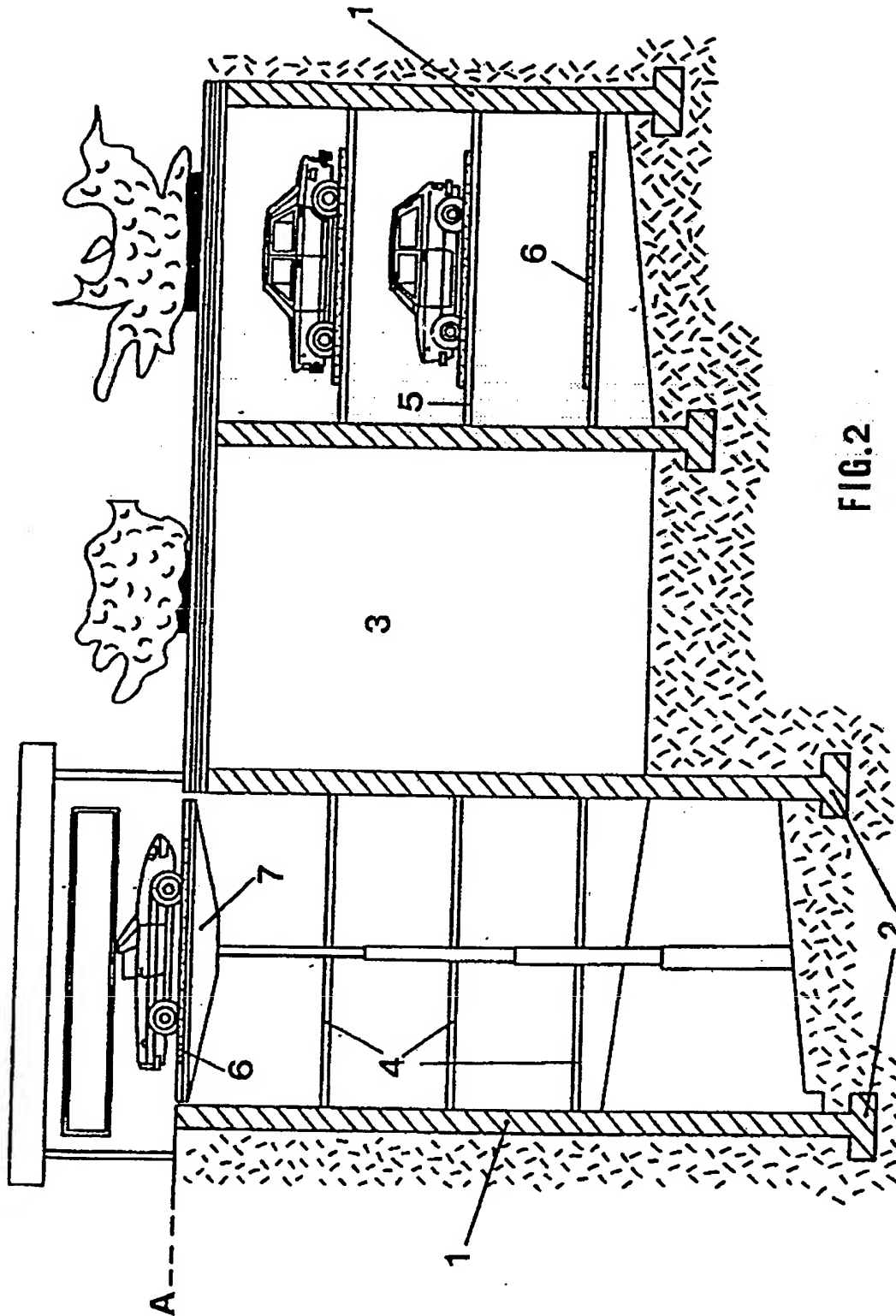
6.

- once the horizontal parking floor (4) has received the ensemble board/vehicle, a rotation starts that will allow the elevation shelf a free board to bring back to the ground level;
 - 5 - said operations take place until the first parking floor (4) is filled up, and therefore for the following floors until the whole container is filled up;
 - should the whole container be filled up, the parking floors will all be placed with the respective free spaces (0) onto the same vertical axis and in coincidence, 10 and the elevation shelf will be placed at the ground level.
3. A container according to the preceding claims, characterized in that the operation of taking the vehicles will 15 be performed vice versa with respect to the storing ones.

FIG.1



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3/3

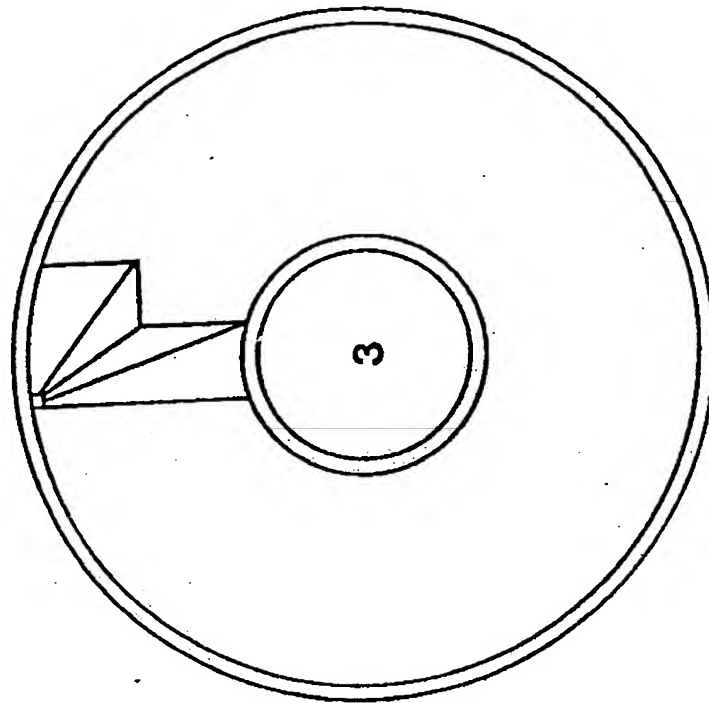


FIG. 4

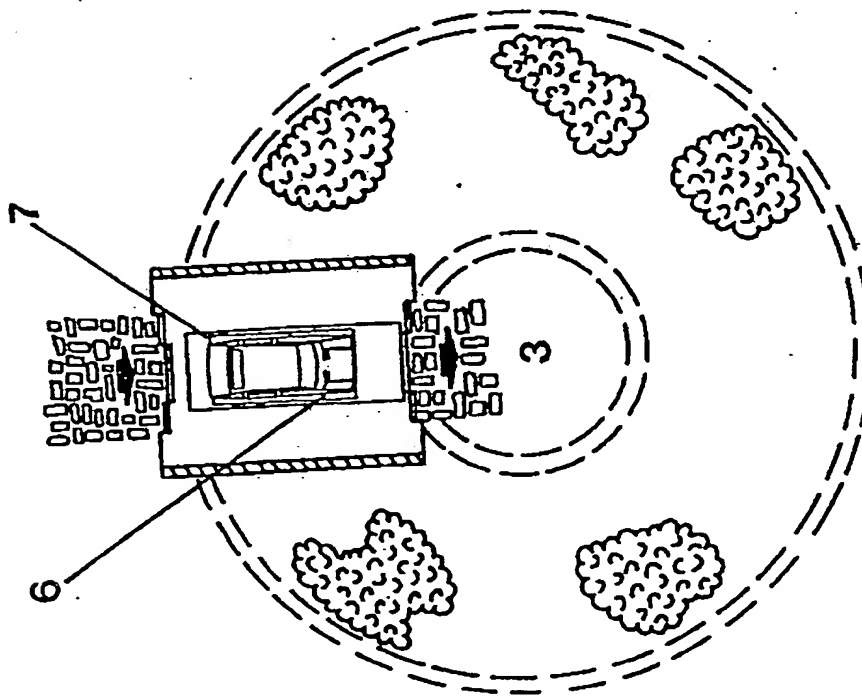


FIG. 3

INTERNATIONAL SEARCH REPORT

International Application No **PCT/IT 87/00104**

| I. CLASSIFICATION OF SUBJECT MATTER (If several classification symbols apply, indicate all) ⁶ According to International Patent Classification (IPC) or to both National Classification and IPC IPC ⁴ : E 04 H 6/28 | | | | | | | | |
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| II. FIELDS SEARCHED <div style="text-align: center; margin-top: 5px;">Minimum Documentation Searched ⁷</div> <table style="width: 100%; border: none;"> <tr> <td style="width: 25%; border: none;">Classification System</td> <td style="border: none;">Classification Symbols</td> </tr> <tr> <td style="border: none; padding-top: 10px;">IPC⁴</td> <td style="border: none; padding-top: 10px;">E 04 H</td> </tr> </table> <div style="text-align: center; margin-top: 10px; font-size: small;">Documentation Searched other than Minimum Documentation to the extent that such Documents are included in the Fields Searched ⁸</div> | | | Classification System | Classification Symbols | IPC ⁴ | E 04 H | | |
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| III. DOCUMENTS CONSIDERED TO BE RELEVANT ⁹ <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 10%; text-align: left; padding: 5px;">Category ⁹</th> <th style="width: 60%; text-align: left; padding: 5px;">Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹²</th> <th style="width: 30%; text-align: left; padding: 5px;">Relevant to Claim No. ¹³</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; vertical-align: top; padding: 10px;">X</td> <td style="padding: 10px;"> FR, A, 1099082 (ROSTAIN) 30 August 1955 see page 1, column 1, line 8 - page 1, column 2, line 15; page 2, column 1, line 21 - page 4, column 1, line 16; figures 1,2 <div style="text-align: center;">-----</div> </td> <td style="text-align: center; vertical-align: top; padding: 10px;">1-3</td> </tr> </tbody> </table> | | | Category ⁹ | Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹² | Relevant to Claim No. ¹³ | X | FR, A, 1099082 (ROSTAIN) 30 August 1955 see page 1, column 1, line 8 - page 1, column 2, line 15; page 2, column 1, line 21 - page 4, column 1, line 16; figures 1,2 <div style="text-align: center;">-----</div> | 1-3 |
| Category ⁹ | Citation of Document, ¹¹ with indication, where appropriate, of the relevant passages ¹² | Relevant to Claim No. ¹³ | | | | | | |
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| <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>[*] Special categories of cited documents: ¹⁰</p> <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="width: 45%;"> <p>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principles or theory underlying the invention</p> <p>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step</p> <p>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>"G" document member of the same patent family</p> </div> </div> | | | | | | | | |
| IV. CERTIFICATION <table style="width: 100%; border: none;"> <tr> <td style="width: 50%; border: none; padding: 5px;"> Date of the Actual Completion of the International Search <div style="text-align: center; font-weight: bold;">1st March 1988</div> </td> <td style="width: 50%; border: none; padding: 5px;"> Date of Mailing of this International Search Report <div style="text-align: center; font-weight: bold;">08 APR 1988</div> </td> </tr> <tr> <td style="border: none; padding: 5px;"> International Searching Authority <div style="text-align: center; font-weight: bold;">EUROPEAN PATENT OFFICE</div> </td> <td style="border: none; padding: 5px;"> Signature of Authorised Officer <div style="text-align: center;"> <div style="display: flex; align-items: center; justify-content: center;"> <div style="border-top: 1px solid black; width: 100px; height: 2px;"></div> <div style="margin-left: 5px; font-weight: bold;">P.C.G. VAN DER PUTTEN</div> </div> </div> </td> </tr> </table> | | | Date of the Actual Completion of the International Search <div style="text-align: center; font-weight: bold;">1st March 1988</div> | Date of Mailing of this International Search Report <div style="text-align: center; font-weight: bold;">08 APR 1988</div> | International Searching Authority <div style="text-align: center; font-weight: bold;">EUROPEAN PATENT OFFICE</div> | Signature of Authorised Officer <div style="text-align: center;"> <div style="display: flex; align-items: center; justify-content: center;"> <div style="border-top: 1px solid black; width: 100px; height: 2px;"></div> <div style="margin-left: 5px; font-weight: bold;">P.C.G. VAN DER PUTTEN</div> </div> </div> | | |
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ANNEX TO THE INTERNATIONAL SEARCH REPORT
ON INTERNATIONAL PATENT APPLICATION NO.

IT 8700104
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